Late Backup

City of Austin-LCRA Water Partnership
2010 Annual Report

I. Purpose of Annual Report

The City of Austin-Lower Colorado River Authority (LCRA) Water Partnership (Water Partnership) is charged with providing a written Annual Report on the status and direction of water supply discussions as considered by the Water Partnership during the previous year. The Annual Report will eventually document the future decisions related to increases in water supplies as the need develops. However, the Water Partnership has primarily focused on water issues other than supply acquisition in 2010. Therefore, this Annual Report focuses on and summarizes these efforts.

II. Background on Partnership

A. History

The Water Partnership was created through the June 2007 City of Austin and LCRA Settlement Agreement. The November 2007 Supplemental Water Supply Agreement provides additional details on roles, responsibilities and expectations related to the Water Partnership, including the establishment of a stakeholder group.

The Water Partnership was formed to provide a cooperative management structure through which Austin and LCRA staff can work to collaborate and more effectively manage both entities' water supplies and resources. The Water Partnership in effect formalizes the on-going meetings between the staffs of the two entities to assure regular communication on matters of mutual concern. Austin and LCRA have recognized the complex and diverse nature of water supply planning and management of water resources in the Lower Colorado River Basin. Through the Partnership, both entities seek to cooperate, improve communication, and avoid future conflicts.

The Partnership and its various committees continue to meet on a regular basis and will continue to work cooperatively on water supply, conservation, quality, and permitting issues. As needed, the Water Partnership will present recommendations to the Austin City Council and LCRA Board for approval.

B. Cooperative management structure

Under the leadership of the Austin City Council and the LCRA Board of Directors, as directed by the City Manager and LCRA General Manager, the Water Partnership is composed of a series of committees headed by the Executive Management Committee (EMC). For reference, a depiction of the general organizational structure of the Water Partnership is shown in **Attachment A**.

Committees: General Purpose

The following are brief descriptions of current committees. Committee members are listed in **Appendix 1**.

Executive Management Committee

The Executive Management Committee (EMC) is composed of two members from the City of Austin, designated by the City Manager, and two members from LCRA, designated by the General Manager.

The Executive Management Committee is responsible for carrying out the purpose and scope of the Water Partnership. This committee oversees the work of the sub-committees, including among other things, evaluation of and implementation of any approved joint water supply strategies.

Technical Committee

The Technical Committee is a standing committee made up of City of Austin and LCRA staff members appointed by the EMC. The committee is charged with developing projections of water demands, coordination on water use reporting, identification and evaluation of water supply alternatives, developing technical analyses and implementation plans for water supply strategies identified for further study, and other technical projects or issues as assigned by the EMC.

Water Conservation Committee

The Water Conservation Committee is a special committee made up of City of Austin and LCRA staff members appointed by the EMC. Consistent with the Settlement Agreement, the Water Conservation Committee developed the Water Conservation Plan which was approved by the EMC. The Water Conservation Committee is also charged with implementing the associated plans and scope of work, as approved by the EMC.

Water Quality Committee

The Water Quality Committee is a special committee made up of City of Austin and LCRA staff members appointed by the EMC. The committee is responsible for developing a proposed plan and scope of work for review and approval of the EMC, in order to implement Section 3.13.1.2 of the November 2007 Supplemental Water Supply Agreement. This section pertains to water quality monitoring and evaluation. The Water Quality Committee is also charged with implementing the associated plans and scope of work, as approved by the EMC.

Stakeholder Committee

This stakeholder group is comprised of a balanced and diverse group of organizations and individuals interested in the Parties' water supply discussions. The Stakeholder Committee is charged with providing feedback and input to the EMC, when water supply issues arise.

The Stakeholder Committee members, appointed by the Austin City Council and the LCRA Board of Directors, represent a wide-variety of interests including environmental, rate payers, business, agriculture, conservation, industrial, and high growth.

III. Summary of Year 2010 Activities

A. Highlights of Municipal Water Supply Discussions

There were no formal discussions directed towards securing additional municipal supplies for the City of Austin in the previous year. The current municipal supply contract with LCRA, which was negotiated in 1999, will meet the City's demands up to 325,000 acre-feet per year. To compare, the City's annual diversions for municipal purposes have recently averaged approximately 165,000 acre-feet/year. According to the Supplemental Water Supply Agreement of 2007 ("SWSA"), the Water Partnership must begin a long term planning process for additional supplies soon after Austin's municipal demand exceeds 225,000 acre feet per year but may decide to initiate those discussions at an earlier date. Supply planning for Austin's non-municipal water needs may also occur at any time.

B. Highlights of Activities and Discussions

1. City of Austin Demand Projections.
The Supplemental Water Supply Agreement (SWSA) contemplates that the City would develop a Demand Projection of its forecasted water use by the end of 2010. To allow for the needed input from the Stakeholder Committee, the EMC agreed to extend the date for submission of the Demand Projection to March 31, 2011. In addition, the City has agreed to update its Demand Projection after it completes its ongoing process related to water conservation. When that process is complete, the EMC will determine an appropriate time for submitting the updated projection.

2. Water Quality Report. The Water Quality Committee submitted a plan and scope of work to the EMC for approval on September 10, 2010. The EMC approved the scope with an additional request to include costs for each entity in the report. The Committee developed the report required by Section 3.13 of the SWSA, entitled LCRA / City of Austin Water Quality Monitoring and Assessment Evaluation. The report is being provided to the City Council and LCRA Board consistent with the agreement, as an attachment to this annual report (attached hereto as **Appendix 3**).

3. Stakeholder Committee. The Austin-LCRA Water Partnership Stakeholder Group met on April 23, 2010 for a tour of the Lakeway Municipal Utility District (Lakeway MUD) water and wastewater treatment facilities. Lakeway MUD General Manager Richard Eason led a tour of the facilities. Stakeholders discussed water issues ranging from long-term water supply options to wastewater reuse and water conservation in the Highland Lakes area, economic growth, and other related topics. The Stakeholder

Committee will meet in early 2011 to receive information related to Austin's Demand Projection.

4. Water Conservation LCRA and Austin continued to work together to encourage water users throughout central Texas to implement water conservation. A joint staff meeting was held on April 21, 2010 to share information on current programs and discuss opportunities for working together. Staff agreed that programs should strive to be as consistent as possible. For example, a hotel/motel conservation program is being planned by both entities and staff have agreed to coordinate on conservation certification criteria. Staff from both the LCRA and Austin felt that the joint meeting was productive and informative and would like to meet yearly. LCRA and Austin conservation and communication staff also met in September to discuss future opportunities for conservation media campaigns.

5. Water Use Reporting. LCRA and the City of Austin coordinated on water use reporting for the 2009 submittals to TCEQ in March 2010 and will again coordinate for the 2010 report due on March 1, 2011.

6. Lady Bird Lake Level Maintenance.
Section VII.D of the Settlement Agreement directs the Water Partnership to develop a proposal to address the maintenance of lake levels for Lady Bird Lake (LBL). The City gave notice to LCRA by letter dated February 5,, 2010, requesting the LCRA account for this water use consistent with and under the 1999 Agreement. Since that time, City and LCRA staff has been developing operational protocols consistent with that letter. A copy of the letter is attached as **Appendix 4**.

7. Waller Creek Tunnel Project. The City of Austin is in the design stages of a project to address flooding along Waller Creek downstream of Waterloo Park in Central Austin. The core feature of this project will be a tunnel to divert and convey flood water to Lady Bird Lake from a new drop inlet structure in Waterloo Park and two minor inlets along the creek below the park. The EMC and Technical Committee are being kept apprised of the project's progress and any water supply issues that may need to be addressed. A water supply contract for the project, between LCRA and the City of Austin, is now in place. The contract provides the City with firm water from the LCRA System for tunnel inundation and recirculation, creek surface losses and park irrigation. Efforts to obtain TCEQ required water rights permitting for the project are on-going; the water right amendment application was submitted to TCEQ on July 15, 2010. The project is anticipated to be complete and on line by approximately 2015.

8. Stoneledge Quarry. The City of Austin's Watershed Protection and Development Review Department is considering the use of an inactive quarry adjacent to Little Bear Creek, a tributary of Onion Creek, as a means of recharge enhancement to the Barton Springs segment of the Edwards Aquifer. The intent of the additional recharge is to augment flow at Barton Springs. According to the project design, flash flood events

(flows greater than 50 cubic feet per second) on Little Bear Creek would be partially diverted into the quarry and allowed to recharge the underlying aquifer. The City of Austin, LCRA, and Barton Springs Edwards Aquifer Conservation District entered into an interlocal agreement, which has been approved and is awaiting final execution by the parties to address the water supply aspects of the project. A copy of the unsigned interlocal agreement is attached as **Appendix 5**.

9. Accounting for Water Use at Fayette Power Project (FPP).
The EMC directed the Technical Committee to evaluate options for accounting for Austin Energy's water use at FPP between Austin's run-of-river water right and firm water provided by LCRA under contract. Staff from the City and LCRA are continuing to explore various options and will present their recommendations to the Technical Committee in the near future, for subsequent consideration by the EMC.

10. Region K. Region K completed its Initially Prepared Plan (IPP) for the 2011 planning cycle. Public meetings and a public hearing on the IPP were held. Public comment period closed June 28, 2010. Region K approved a regional plan for this planning cycle and submitted it to the Texas Water Development Board on September 1, 2010. City of Austin and LCRA and their respective consultants continue to actively work with the Region K Planning Group and the Region K consultant in this effort.

11. Coordination of Operations affecting Lady Bird Lake. Over the last year, several outside entities have approached either LCRA or Austin with requests to modify operations of Lady Bird Lake or install facilities that would affect operations of Lady Bird Lake or Longhorn Dam. The EMC has designated the Technical Committee as the appropriate forum to address and coordinate responses regarding these types of requests or proposals. In addition, Austin and LCRA have identified a need to develop a more closely coordinated and deliberate approach to various operational activities that may impact each others' day-to-day operations, such as diversions at Austin's downstream power plants and LCRA's floodgate operations affecting Lady Bird Lake levels. A team of staff from both Austin and LCRA has been working on these issues.

12. LCRA Draft Permit 5731 (Unappropriated Flow Permit) and Draft Amendment 14-5434E (Garwood Amendment). The Technical Committee continues to receive updates from LCRA staff on the progress being made with these matters.

13. Annual briefing to Water and Wastewater Commission - An Annual Briefing will be scheduled for early 2011.

14. Joint Reuse Application - Austin and LCRA staff are continuing to work on development of a joint reuse application, consistent with the concepts in the 2007 Settlement Agreement, with the intent to file the application in the coming months.

15. LCRA's Water Management Plan - In 2010, the City of Austin participated as a member of the LCRA Water Management Plan Revision Advisory Committee which is tasked with providing input to LCRA regarding revisions to the LCRA's Water Management Plan (WMP). The City will continue to participate in the process in 2011. The LCRA WMP is a TCEQ approved plan for managing stored water from lakes Travis and Buchanan for various uses.

In 2009, the City was one of several parties that provided input in the drafting of an Agreed Order regarding TCEQ approval of the WMP amendment submitted in 2003. TCEQ approved the amended WMP in January 2010. The Agreed Order asks LCRA to work with stakeholders on the next revision of the WMP in an effort to address key issues identified in the Agreed Order. The stakeholder meetings, which started in July 2010, include participants from four main interest groups representing firm customers, interruptible customers (generally agricultural interests), lake (commercial and residential), and environmental interests. The goal of the process is to achieve consensus to the greatest extent possible on key issues for incorporation into the next update to the WMP to be submitted to the LCRA Board for review and approval prior to filing the WMP amendment with TCEQ.

IV. Brief summary of planned year 2011 activities

Upcoming events,

- Annual briefing to Austin City Council (early 2011)

Updates to the LCRA Board of Directors to be provided, as needed.

Planned Year 2011 Activities

- Finalize City of Austin water Demand Projections by March 31, 2011
- Continue implementation of the Stoneledge Quarry recharge pilot project
- Continue coordination on water use reporting
- Continue water supply planning and evaluation
- Continue coordination on water conservation strategies
- Conduct annual briefings
- Continue coordination regarding LCRA and Austin pending water rights permits at TCEQ
- Participate in LCRA's Water Management Plan update process
- Continue Work on Joint Reuse Application

Appendix:

1. Listing of committee members
2. "Exhibit A" from June 18, 2007 Settlement Agreement: COA and LCRA Water Resources Management Partnership
3. Water Quality Report
4. Letter Agreement - Lady Bird Lake
5. Interlocal Agreement – Stoneledge Quarry

Approved By:

Becky Motal
Executive Manager, External Affairs
Lower Colorado River Authority

Rudy Garza
Assistant City Manager
City of Austin

Suzanne Zarling
Executive Manager, Water Services
Lower Colorado River Authority

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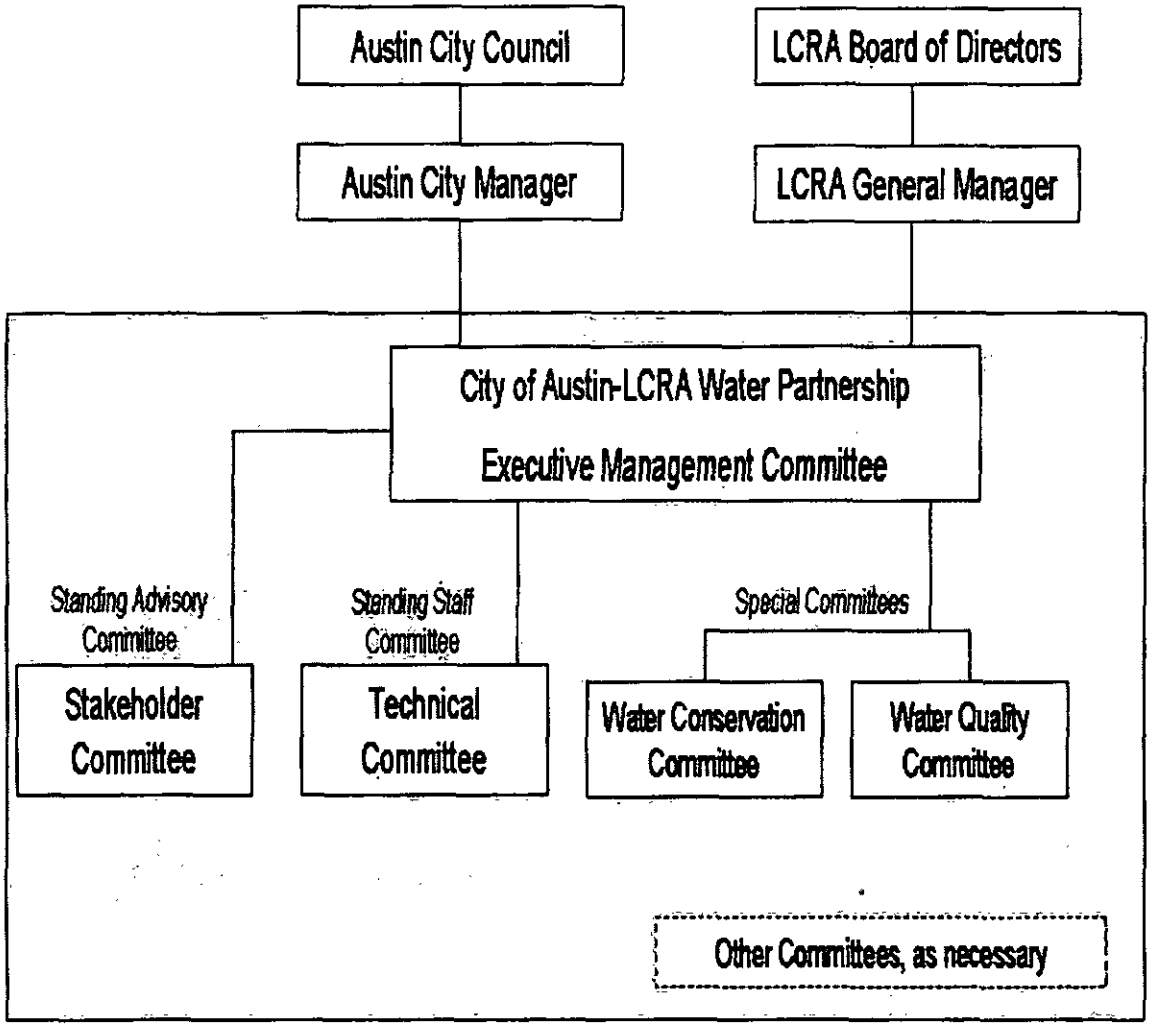
City of Austin

City of Austin-LCRA Water Partnership Organization



Attachment A

Appendix

Appendix 1.
Committee Members

Executive Management Committee (as of November 2010)

City of Austin

Rudy Garza, Assistant City Manger
Greg Meszaros, Director, Austin Water Utility

LCRA

Suzanne Zarling, Executive Manager, Water Services
Becky Motal, Executive Manager, External Affairs

Technical Committee (as of November 2010)

City of Austin

Daryl Slusher, Assistant Director, Austin Water Utility
Teresa Lutes, Managing Engineer, Austin Water Utility
Ross Crow, Assistant City Attorney, Law Department

LCRA

James Kowis, Manager, Water Supply Planning
Steve Kellicker, Manager, Corporate Finance
Lyn Clancy, Managing Associate General Counsel, Legal Services

Water Conservation Committee (as of November 2010)

City of Austin

Daryl Slusher, Austin Water Utility
Drema Gross, Austin Water Utility

LCRA

Nora Mullarkey, Manager, Water Conservation

Water Quality Committee (as of November 2010)

City of Austin

Daryl Slusher, Austin Water Utility
Nancy McClintock, Watershed Protection and Development Review

LCRA

Lisa Hatzenbuehler, Manager, Water Resource Protection

Stakeholder Committee (as of January 2011)

Interest Category	Member
Agricultural	Ronald Gerston
At large	Mary Ann Hefner
Business	Barbara Johnson
Business	Hank Smith
Conservation	Mike Personett
Environmental	Jennifer Walker
Environmental	Andrew Sansom
High Growth	Jon Beall
High Growth	Pete Dwyer
High Growth	Valarie Bristol
Industrial	Sandra Dannhardt
Industrial	Dan Wilcox
Rate Payers	Debbie Gernes
Rate Payers	Marion Sanchez
Recreation	Vacant

Appendix 2.

EXHIBIT A - COA and LCRA Water Resource Management Partnership

From the:

SETTLEMENT AGREEMENT BY AND BETWEEN THE CITY OF AUSTIN AND THE LOWER COLORADO RIVER AUTHORITY REGARDING JOINT WATER RESOURCE MANAGEMENT AND THE RESOLUTION OF CERTAIN REGULATORY MATTERS PENDING AT THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

EFFECTIVE DATE: JUNE 18, 2007

1. **Background:** Water is the lifeblood of Central Texas communities. Austin and LCRA have individually employed traditional water management strategies, focusing on solutions that have often unintentionally led to conflict. These conflicts, if left unresolved, may limit the ability of the Parties to meet their responsibilities as major water suppliers. As population growth and economic factors in the region increase the demand for water, the Parties recognize a different approach is needed. Collaborative water management strategies can offer new opportunities to optimize water supply solutions for the region.

2. **Vision:** Reliable and affordable water, managed in an environmentally responsible and collaborative manner, is critical to the vitality and economy of the region.

3. **Purpose:** LCRA and Austin, as the two largest water right holders in the lower Colorado River basin, have agreed to develop a cooperative management structure. Through this new approach, the Parties will jointly evaluate and implement strategies to optimize water supplies to meet water needs of their customers and the environment.

4. **Scope:** The scope of the partnership agreement will include joint water supply planning, as well as the ability to manage both entities' individual raw water supplies as an integrated system. All existing raw surface water supplies, including Return Flows, of each party will be included in this agreement. Future water supplies will be included as approved by the Executive Management Committee.

   Day-to-day management and coordination of the river system including flood management, water quality protection and other functions will remain LCRA's

responsibility. Day-to-day water/wastewater utility planning and operations will remain the responsibility of each party.

5. **Cooperative Management Structure:** The Parties shall establish an Executive Management Committee and Technical Water Resources Planning Subcommittee, with the following structure and responsibilities:

A. Executive Management Committee

I. Composition: The Executive Management Committee (EMC) will be composed of two representatives each of Austin and LCRA, to be designated by the chief executive officer of each organization.

II. Duties and Responsibilities: The EMC will be responsible for carrying out the Purpose and Scope as follows:

1. establishing and implementing strategic goals and policies,
2. approval of joint water supply strategies and implementation plans,
3. continued supervision and oversight of approved joint water supply strategies and implementation plans,
4. obtaining any necessary approvals from and ensuring compliance with requirements of each party's governing body,
5. coordination of communication with internal and external stakeholders,
6. ensuring adherence to the decision-making guidelines set forth below,
7. creation and general supervision of any subcommittees necessary to carry out the Purpose and Scope, and
8. developing standard operating procedures and bylaws for the EMC and any subcommittees.

B. Technical Water Resource Planning Subcommittee. A Technical Water Resource Planning Subcommittee (Technical Subcommittee) shall be established as follows:

i. Composition: The Technical Subcommittee will be an interdisciplinary committee comprised of members appointed by the EMC.

ii. Duties and Responsibilities. The Technical Subcommittee will be responsible for:

1. Projections of water demands and identification of a wide array of supply alternatives, including Return Flows, and preliminary recommendation of alternatives for consideration by the EMC for further study.

2. In consultation with the EMC, develop any necessary technical analyses and implementation plans for strategies identified for further study.

C. Decision-making Guidelines

i. Consensus decisions of the EMC shall be made using interest-based problem solving, mindful of the standards and mutual interests of the Parties as set forth below.

ii. The standards against which water supply strategies shall be evaluated include:
   1. Improve relationships between Austin and LCRA
   2. Cost effective and provides value to both Parties
   3. Obtain stakeholder input in an effort to fairly address multiple needs of the region

iii. The mutual interests of the Parties to be addressed by any water supply strategy selected by the EMC include:
   1. maintaining ownership and protecting the value of each party's individual water rights,
   2. preserving water quality and environmental health of the river and bay system,
   3. improving the Parties' relationship and building trust through enhanced information sharing, cooperation, and partnering,
   4. improving water supply certainty, including enhancing reliability and water availability, and
   5. responsible water resource management, mindful of the Parties commitment to a strong water conservation ethic.

iv. The Parties may, by consensus, modify the standards and mutual interests to be used in making decisions under this agreement.

v. If the EMC cannot reach a consensus decisions on whether to pursue particular water supply strategies recommended by the Technical Subcommittee, then the EMC shall request a decision from the chief executive officers of each organization.

6. Operating Guidelines:

A. The Parties agree to designate their representatives to the Water Partnership Executive Management Committee (EMC) within 90 days of the final approval of the Supplemental Water Supply Agreement called for in Paragraph 1V.B of the Settlement Agreement. The Parties also agree to convene an initial meeting of the EMC within 120 days of execution of the Supplemental Water Supply Agreement.

B. The initial tasks of the EMC include, but are not limited to:

i. Develop operating procedures and by-laws, to include but not be limited to:

1. Set meeting schedule to initially include a minimum of one EMC meeting per quarter
2. Set meeting logistics including chair, chair rotation schedule, meeting location, and record keeping, including meeting minutes, workplans, etc.
3. Set schedule and process to develop scopes and workplans for tasks to be accomplished by the COA and LCRA Water Resource Management Partnership
4. Set reporting schedule to include a minimum reporting schedule of at least one report to each the Austin City Council and the LCRA Board every two years
5. Set regular quarterly meeting format to include, as appropriate, but not be limited to:
   a. Report by each party on all activities that might affect either party's water rights or water supply, which may include any significant developments in the following:
      i. status of
         - all water rights applications
         - a water supply development projects (current or proposed Water Management Plan status)
         - any proposed water treatment, wastewater treatment or other related facilities
         - any direct reuse projects
         - water conservation efforts
      ii. status of joint efforts and suggestions for additional joint effort opportunities
      iii. updates on studies relevant to water supply availability

iv. updates on relevant environmental issues and implementation of environmental policies
v. relevant legislative updates including new statutes and pending legislation relating to water supply of the Parties
vi. Relevant administrative matters before the State Office of Administrative Hearings
vii. Updates on significant actions or decisions by the Texas Commission on Environmental Quality
viii. Update on water rates revisions
ix. Information on water sales, water usage, major diversions, new customers, and projected water demands (short and long-term)
x. Update on any LCRA Water Management Plan planned amendments
xi. State Region K regional water planning efforts
xii. Update on LCRA Board and Austin City Council actions relevant to water supply availability

b. Subcommittee reports
c. Other items as determined

6. Set meeting process to initially include a minimum of two work sessions per year
   a. Work session tasks may include, but not be limited to:
      i. develop joint basin management strategies in keeping with the mutual interests of the parties as outlined in Exhibit A. Section 5. C. iii., and updated, as needed, by the EMC.
      ii. develop plans for joint studies and projects,
      iii. develop any joint resolutions, proposed agreements,
      iv. Formulate subcommittees, as needed
      v. Evaluate on-going efforts of the COA and LCRA Water Resource Management Partnership including a re-evaluation of the scope and purpose, including progress of efforts to meet long-term water supply needs
7. Appoint the Technical Water Resource Planning Subcommittee

8. Develop initial scope and workplan to address the following:
    a. Develop initial scope of tasks to be accomplished in the initial two years, including but not limited to:
        i. As per Settlement Agreement Section VII. D., develop proposal to address maintenance of Town Lake levels
        ii. Establish process to evaluate and implement joint water management strategies to optimize water supplies
    b. Establish coordination of reporting, operations, and diversions
    c. Develop a list of matters to be monitored by the EMC
    d. Develop process for determining future tasks and work plans, once initial tasks are complete, including development of demand projections ("Demand Schedule")

Appendix 3.

[Water Quality Report]

LCRA / CITY OF AUSTIN WATER PARTNERSHIP
WATER QUALITY MONITORING AND ASSESSMENT EVALUATION REPORT
December 22, 2010

Introduction

The Water Partnership, formed from the Supplemental Water Supply Agreement (SWSA) will establish a process for monitoring water quality of the springs, streams, lakes within the City of Austin that received runoff from areas served by LCRA and for considering water quality impacts if any, of Supply Decisions evaluated by the Water Partnership.

The Water Partnership will establish a process, to include public meetings (preceded by public notification) and the stakeholder process established under Section 4.1 for considering various strategies that may be available to address any adverse water quality impacts that might be identified prior to those water supply decisions being made.

The Water Partnership will evaluate available regulatory tools, incentives, or other mechanisms and regional approaches that maybe available to help safeguard against any water quality impacts of concern that the Water Partnership may identify.

For these purposes, the Water Partnership will use, to the maximum extent possible, the existing mechanisms and information, such as the Clean Rivers Program, interlocal agreements regarding nonpoint source pollution prevention, existing studies, and ongoing water quality monitoring and modeling efforts, to collect and assess relevant water quality information.

On or before the date on which Austin develops its first Demand Projection under this SWSA, the Water Partnership (or thereof) shall report to the Parties' respective governing bodies on its efforts, and shall include a summary of its findings, as well as any recommendation for further study or action.

Water Quality Committee

The Water Quality Committee is a special committee made up of the City of Austin and LCRA staff members appointed by the Executive Management Committee (EMC). *"The committee is responsible for developing a proposed plan and scope of work for review and approval of the EMC, in order to implement Section 3.13.1.2 of the November 2007 Supplement Water Supply Agreement."* This section pertains to water quality monitoring and evaluation. The Water Quality Committee is also charged with implementing the associated plans and scope of work as approved by the EMC.

The Water Quality Committee submitted a plan and scope of work to the EMC for approval on September 10, 2010. The EMC approved the scope with an additional request to include costs for each entity in the report. This report meets the requirements of Section 3.13.1.2 in

addition, the Committee has further defined the area of focus where the committee will direct its efforts. See Attachment 1 – Water Quality Committee Area of Focus.

Historical Information

The Texas Clean Rivers Program (CRP) is a state-wide water quality program that emphasizes monitoring and public outreach to protect Texas' surface water. The Texas Commission on Environmental Quality (TCEQ) funds the program while regional partners such as river authorities, cities and water districts administer program activities. Since the program began in 1991, the Lower Colorado River Authority (LCRA) has been the lead CRP agency in the Colorado River basin, working with the City of Austin (COA) Watershed Protection Department and other groups to foster CRP goals. Those goals are:

- Maintain a basin-wide monitoring program to collect quality-assured water quality data
- Encourage comprehensive and cooperative watershed planning
- Identify, analyze and report on water quality issues and potential causes of pollution
- Enhance education about water quality issues through public meetings and outreach materials

Colorado River CRP partners monitor sites under the state approved quality assurance plan; this includes sites monitored by COA and monitored by LCRA. The chemical and biological data collected in and around Austin provides valuable information to decision makers and is the basis for TCEQ's biannual water quality assessment. The assessment, which is performed every two years, identifies water bodies that do and do not meet *Texas Surface Water Quality Standards*.

The CRP partnership also includes the coordination of monitoring efforts. City of Austin and LCRA regularly participate in Surface Water Quality Monitoring Workshops provided by TCEQ. These events ensure that appropriate field and laboratory protocols are used when sampling and analyzing water quality.

Interagency monitoring meetings are held annually to coordinate and prioritize monitoring. Sample sites, parameters and frequency are determined based on input from each monitoring entity. The meetings provide a venue to exchange information about local water quality issues and an opportunity to share resources and equipment. They ensure the best use of monitoring resources by reducing unnecessary "over monitoring" by multiple agencies at the same site. Sites may also be shared by agencies when extensive monitoring is necessary.

Assessment of Current Monitoring and Assessment Efforts

The spatial, frequency and parameters of the monitoring sites identified in the 2010/2011 Clean Rivers Program – Colorado River Basin meets the needs for LCRA and COA within the area of

focus. See Map Attachment 2 – Water Quality Committee Monitoring Locations. LCRA and COA monitor strategically throughout the area of focus at 78 sites for 16 chemical parameters, five field instrument readings and eight field observations. In addition, annual coordinated monitoring meetings are the venue in which the Water Quality Subcommittee of the LCRA /COA Partnership can raise requests to add or delete monitoring sites, parameters, or increase/decrease frequency. For a site to be included in CRP monitoring it must meet specific criteria. Whether or not the request can be included under CRP or whether LCRA or COA would have to satisfy the request outside of CRP can be decided at the annual meeting.

Also shown on the map are 86 volunteer monitoring sites throughout the area of focus. The Colorado River Watch Network is a group of citizen volunteers that submit monthly data to LCRA. They are the early warning system throughout the basin and generally are the first to note water quality anomalies and problems.

Cost of Water quality Monitoring Program within the Area of Focus

LCRA Water Quality Costs in Area of Focus:

Water Quality Program	Annual Cost
Clean Rivers Program Related[1]	$256,779
Colorado River Environmental Models[2]	$308,016*
Colorado River Watch Network[3]	$211,576
2010 Subtotal Total	**$776,371**
2010 Grand Total (minus CREMS)	**$468,355**

2010 Annual Costs:

1. CRP Related is the annual cost for monitoring of sites shown on Attachment 2, analytical for those sites, quality assurance oversight, data submittal, and monitoring coordination.
2. CREMS is the annual cost of the Lake LBJ model development. * This is a onetime cost and will not be recurring annually once the models are complete.
3. CRWN is the annual cost for the sites shown on Attachment 2.

City of Austin Water Quality Costs in Area of Focus:

Water Quality Program	Annual Cost
Environmental Integrity Index	$60,197
Lady Bird/Walter Long/Lake Austin Monitoring	$16,032
Groundwater	$22,818
Grand Total	**$99,047**

2010 Annual Costs:

- Each of the three categories has a CRP component for COA monitoring and are shown on Attachment 2.

- Each of the three categories includes monitoring and analytical costs.

Summary of Jurisdictions with Regulatory Authority, Incentives, and Regional Plans

U.S. Fish and Wildlife Services (USFWS) Measures: The LCRA entered into a Memorandum of understanding with the US Fish and Wildlife Service and a settlement agreement with the Save Our Springs Alliance and other parties that all new development wanting service from the LCRA 290 pipeline would meet certain water quality protection measures. The 290 pipeline generally serves development along Highway 290 from Bee Cave in Travis County to just west of Dripping Springs in Hays County. LCRA agreed to provide water service to New Development only where (a) the development complies with any final water quality protection measures that result from the USFWS review of LCRA's environmental study, or (b) USFWS determines in writing that the water quality protection measures proposed for the development are consistent with the requirements of the Endangered Species Act (ESA), or (c) the development complies with a regional plan that FWS determines in writing is consistent with the requirements of the ESA. The FWS has determined that the Optional Enhanced Measures developed by TCEQ qualify as a regional plan.

Texas Commission on Environmental Quality (TCEQ): TCEQ has a number of water quality protection programs within the area of focus. TCEQ regulations overlap all other jurisdictional requirements. In other words, TCEQ regulation apply in addition to other local jurisdictions that have water quality protection regulations. The TCEQ regulations that apply within the area of focus are Stormwater Permit for Construction, Edwards Rules, Water Quality Permitting for Wastewater, and Optional Enhanced Measures for Endangered Species protection.

Stormwater Permit for Construction: TCEQ issues general stormwater construction permits for development statewide. This general permit addresses stormwater runoff during the construction phase of a project. It does not include any permanent water quality control measures once construction is complete. This permit is designed to manage stormwater runoff and sediment during the construction phase of a project.

Edwards Aquifer Protection Rules: These rules require a permit and address activities that could pose a threat to water quality over the Edwards Aquifer recharge and contributing zone, including wells and springs fed by the aquifer and water sources to the aquifer, including uplands areas draining directly to it and surface streams. These rules apply specifically to the Edwards Aquifer in eight counties, including Travis and Hays Counties, and are not intended for any other aquifers in Texas.

Water Quality Permitting: TCEQ permits requests for wastewater discharge and land application of effluent statewide. TCEQ performs a level review for water quality protection. There is a public process that the LCRA and COA (and anyone else who may want to participate) typically participate in when water quality protection of receiving streams can be enhanced.

The process includes a comment period, reconsideration of staff decisions and contested case hearing requests. See section of this report entitled Other Water Quality Coordinated Efforts. Optional Enhanced Measures. The USFWS issued letters on September 4, 2007, to Governor Rick Perry. The letters are a concurrence that non-federal landowners and other non federal managers under the TCEQ Edwards Aquifer Protection Program would have the support of the Service that no take under the Endangered Species Act would occur if they make use of the optional measures. These optional measures, voluntary under the Edwards Aquifer Protection Program, will protect certain federally listed species from potential water quality impacts that may have otherwise resulted from development over the Edwards Aquifer region. These may or may not apply within the area of focus depending on whether the developer chooses this option or the U.S. Fish and Wildlife Measures within the Edwards Aquifer Region.

Lower Colorado River Authority (Highland Lakes Watershed Ordinance, Onsite Sewage Facilities [OSSF] Regulations): OSSF Program: Texas Commission on Environmental Quality (TCEQ) delegated authority in September 1971 to the LCRA to regulate the installation and operation of on-site sewage treatment and disposal systems generally within a 2,200 foot radius around the Highland Lakes in Burnet, Llano and Travis counties. There are approximately 23,000 systems within this jurisdiction. The LCRA OSSF staff provides a number of services in addition to plan review, permit/license issuance, and inspections for new construction and repairs of old septic systems. The LCRA also requires a thorough inspection of all septic systems when a transfer of ownership occurs. In addition, LCRA has memoranda of understanding with Granite Shoals, Briarcliff, Jonestown , Lakeway, Volente, and Lago Vista to perform OSSF administration and enforcement within their city limits.

Highland Lakes Watershed Ordinance (HLWO): The HLWO covers approximately 1,200 square miles (Burnet, Llano and Travis counties and 18 cities) serves as the regional water quality protection tool, and resulted in the development of a Water Quality Management Technical Manual to guide the engineering and development community through the planning, design, and construction process. The ordinance regulates stormwater runoff from development and quarry and mining projects within the jurisdictional area. There are incentives for developers to use Alternative Standards as outlined in the Ordinance. LCRA has interlocal agreements with Cedar Park, Leander, Briarcliff, Jonestown, Lakeway, Lago Vista, Sunrise Beach, Bee Cave, Volente, Marble Falls, City of Austin, and Travis County. Interlocal agreements outline responsibilities to eliminate duplication in effort and provide a consistent level of water quality protection for the Highland Lakes.

Application Review and Response Program: LCRA reviews each TCEQ water quality permit application. These are generally wastewater discharge and land application of effluent permit requests. LCRA ensures that water quality within the basin is protected. The process includes working with the applicant and TCEQ and may include LCRA commenting on the application, requesting reconsideration, and contested case hearing when necessary.

City of Austin (Interlocal Agreement with LCRA on Watershed Rules): This 2007 interlocal agreement covers the Lake Travis watershed in the City of Austin city limits and ETJ. It consolidates and streamlines development submittals and results in a single development permit being issued by the City that meets or exceeds the water quality protection requirements of the LCRA HLWO. LCRA serves as a consultant on this permitting program especially with respect to variance requests, interpretation of the LCRA ordinance and technical manual, City capital improvement or parks projects, and construction inspection activities. Semi-annual meetings are held to ensure program coordination for these development permits. Cooperation on public education, annexation changes, and ordinance revisions is also addressed in the Lake Travis watershed within the City limits or ETJ.

Groundwater Districts (Barton Springs Edwards Aquifer Conservation District (BSEACD), Hays Trinity Groundwater Conservation District (HTGWCD)): The jurisdiction of the BSEACD covers the unconfined (recharge) zone and the confined zone of the Barton Springs segment of the Edwards Aquifer but not its contributing zone. It includes the locations of all wells in the Barton Springs segment and also the locations of the natural outlets of the aquifer at Barton Springs and several other smaller springs along the Colorado River. Its regulatory authority comes from enabling legislation in Special District Local Laws Code Chapter 8802 subsequently clarified by District rules and bylaws used to guide efforts in water conservation and pollution prevention. These rules include a permitting program for pumpage from the Edwards and Trinity aquifers, well regulations, drought management rules, and enforcement activities. The District also operates under and Texas Water Development Board (TWDB) approved Groundwater Management Plan in accordance with Texas Water code Chapter 36, Section 1071 and Texas Administrative Code Chapter 356 Section 5 and 6. The District notably has developed a conservation credit policy which provides an incentive credit to those production permit holders, which pay an authorized groundwater use fee, for using less water on a sustained basis than they are authorized to use. The District's Groundwater Management Plan is adopted by the Region K Lower Colorado River Regional Water Planning Group administered by LCRA under TWDB rules. Other activities of the District include public outreach, conservation education, and recharge enhancement projects. The District also conducts aquifer monitoring, research and investigations including an ongoing Habitat Conservation Plan for protection of the Barton Springs Salamander.

Similar to the BSEACD, the Hays Trinity Groundwater Conservation District performs groundwater management functions for 370 square miles of western Hays County. It operates under a TWDB approved Groundwater Management Plan which rolls up to the Region K and L Water Planning Groups. The HTGCD developed its own Bylaws and Rules governing operation, drought management, conservation, well registration, aquifer test wells, public water supply connections, and monitoring. They report top water users as an incentive towards conservation and participate in research and education activities similar to the BSEACD.

Barton Springs Regional Water Quality Protection Plan: Affected area for this regional planning effort finalized in 2005 included the entire Barton Springs contributing and recharge zones

covering potions of northern Hays County, southwest Travis County, and a small section of eastern Blanco County. This Regional Group was made up of representatives from the Cities of Dripping Springs, Austin, Buda, Kyle, Rollingwood, Sunset Valley, the Village of Bee Cave, Blanco, Hays and Travis Counties, the Barton Springs/Edwards Aquifer Conservation District, the Hays Trinity Groundwater Conservation District, and the Blanco-Pedernales Groundwater Conservation District. This was a voluntary planning effort; therefore, regulatory jurisdiction is limited to the extent that the participant governing entities can incorporate plan components into their watershed and other ordinances and rules. Components of water quality protection defined in the plan included natural area and open space conservation, transferable development rights, comprehensive site planning and pre-development review, location of development (including stream and critical environmental feature buffers), intensity of development (including specific impervious cover recommendations), control of hydrologic regime through site retention/detention, structural BMPs for discharges from developed land, local enforcement of construction site controls, wastewater management, rainwater harvesting and conservation, restrictions on hazardous material handling, proper vegetation management, agricultural practices, endangered and threatened species protection, and public outreach. Local entities with jurisdiction to implement the plan were identified as well as implementation mechanisms for all jurisdictions. Representatives from these groups continue to meet in order to take advantage of opportunities to apply portions of the plan in each jurisdiction and track progress towards full coverage of the plan in the Barton Springs Zone.

Travis County (OSSF, Watershed Development Ordinance, Interlocal Agreement w/LCRA): Travis County adopted water quality protection ordinance in 2010. The ordinance covers unincorporated areas of Travis County and is similar to LCRA's HLWO with some additional more restrictive criteria. LCRA has an interlocal agreement with Travis County whereby duties are clearly delineated to avoid duplication in efforts for the area that is covered by both LCRA and Travis County's ordinances. Travis County also has TCEQ delegated authority to permit, inspect and enforce OSSF regulations outside the area regulated by LCRA in the unincorporated area of Travis County.

Southwest Travis County Growth Dialog Process (STCGDP): Formed in 2004, the area covered by this planning process included the unincorporated area of Travis County bounded to the west and south by the County boundary, to the north by Lake Travis and the Village of Briarcliff extraterritorial jurisdiction (ETJ) and, to the east by the City of Austin and City of Lakeway ETJ boundaries. The group developed a community based conceptual plan for future development in this area through a series of community meetings over about eight months. The final report covered roadways, water utility service, application of the LCRA HLWO, and implementation proposals. These proposals included specific recommendations in areas of property value and development guidelines, economic development guidelines, regulation guidelines, rural character and development orientation, environmental quality, land preservation/conservation, transportation, and other public infrastructure and services. The overall vision of the effort appeared to be preservation of the areas existing character as growth occurs over a 20-year planning horizon. Coordination was also made with a concurrent

planning effort – the Hamilton Pool Road Forum which was a citizen's panel sponsored by LCRA studying issues for a sub-portion of the STCGDP planning area. Implementation of the plan was entrusted to support staff from the sponsoring agencies of Travis County and LCRA.

Hays County (OSSF, adopting water quality monitoring program - subdivision regulations). Regulatory authority within the jurisdiction of Hays County is provided by state statutes including the Texas Local Government Code, the Texas Water Code, and the Texas Transportation Code among others. Development regulations in Hays County are comprehensive in scope and include subdivision and platting of property, site development review and authorizations, water and wastewater availability, roadway standards, stormwater management standards, construction and acceptance of maintenance for public infrastructure, flood damage prevention, onsite sewerage facilities, land use and location restrictions, conservation development, and development agreements. These regulations provide the backbone of water quality protections in the county. Recently, the county has initiated a water quality monitoring program to gather data on area creeks and facilities in order to target additional structural and non-structural water quality control measures.

Blanco County/Bastrop County: The LCRA's HLWO does not apply in Blanco or Bastrop counties. Both counties are TCEQ authorized agents and implement and enforce the OSSF regulations within their jurisdictions. Both have subdivision regulations that are not specific to water quality protection. TCEQ regulations apply within both counties.

Cities of Bee Cave, Buda, Lakeway, Jonestown, Briarcliff, Lago Vista, Marble Falls, Dripping Springs: There are a number of communities within the area of focus that have adopted water quality protection regulations. In order to avoid overlapping jurisdictions and clarify water quality protection responsibilities, LCRA has entered into interlocal agreements with Bee Cave, Lakeway, Jonestown, Briarcliff, Lago Vista and Marble Falls were the LCRA's HLWO applies. The HLWO does not apply in Hays County. TCEQ regulations apply within a municipalities jurisdiction.

Other Water Quality Coordinated Efforts Between LCRA and COA

LCRA and COA coordinate on other water quality protection efforts in the recent past and present. Those include:

Belterra TCEQ Water Quality Permit Process: LCRA and COA (and others) protested the application for wastewater discharge in to Bear Creek a tributary to Barton Creek and the Colorado River. The resultant settlement agreement provided additional water quality protections over and above what was originally laid out in the draft permit. LCRA and COA will be participating in a joint monitoring project related to this agreement.

United States Geological Survey (USGS) Study of Wastewater Indicators on the Barton Springs Segment of the Edwards Aquifer: LCRA and COA (and others) are contributing to an add-on

study currently underway by USGS on evaluating wastewater indicators on the Barton Springs segment of the Edwards Aquifer commissioned by the TCEQ. This is a result of needing more information and data after the Belterra permitting process. USGS has made presentations on this study and results are being compiled into a final report due in early 2011.

TCEQ Barton/Onion Creek Stakeholder Process: LCRA and COA were invited to participate in a TCEQ sponsored stakeholder process as the result of a petition filed by the BSEACD and COA to prohibit discharges in the Barton and Onion Creek watersheds. The petition was denied and a stakeholder process initiated. The stakeholder process ended without consensus and no other action is anticipated by TCEQ. TCEQ advised stakeholders of their conclusion in February 2010.

Highland Lakes Watershed Rule (Discharge Ban): Two cities challenged a 24 year TCEQ watershed protection rule for the Highland Lakes by filing a petition with the TCEQ to repeal the discharge ban. The rule prohibits wastewater discharges into the Highland Lakes and has been in effect since 1986. The petition was denied in November 2009. TCEQ cited the lack of numerical nutrient criteria for reservoirs (which is currently under development) and denied the petition until the appropriate standards are set in order to evaluate the request properly. However until then the rule stays in place as is. LCRA and COA (and others) provided comments to TCEQ that demonstrated that wastewater discharges would negatively impact the lakes and therefore could not support repealing the rule as it was presented.

Colorado River Environmental Models Project: In 2005, LCRA began developing a water quality model that can predict changes in water quality based on future conditions. The Lake Travis model was completed in January 2009. Presentations were made to interest groups on the capabilities of the models, including COA. As a result of the coordinated effort LCRA has provided COA, at no cost, with the working version of the model so COA can run scenarios of their choosing. Lake Travis is a primary drinking water supply for the City. The third phase of the project will include similar modes for Lakes Inks, LBJ and Marble Falls. Completion of Phase 3 is scheduled for June 2011.

City of Burnet TCEQ Water Quality Permit: The City of Burnet has requested a major amendment to the wastewater discharge permit. The discharge is to Hamilton Creek in Burnet County a tributary to Lake Travis. The draft permit increases the flow to 1.7 MGD at a 5-5-2-.5 treatment level. Burnet currently has a permit allowing discharge into Hamilton Creek, but they rarely discharge. They currently irrigate most if not all of the wastewater on a hay field, the golf course and airport. LCRA and COA (and others) provided comments during the public comment period on the impacts that can be expected based on the CREMS model. Settlement discussions are currently underway between the City of Burnet, LCRA and COA.

LCRA/City of Austin – Interlocal Agreement for Water Quality Protection in the ETJ in Travis County: In 2007, LCRA and COA signed an interlocal agreement pertaining to the management of water quality protection and development within the COA's ETJ in Travis County. The interlocal agreement states that the COA's watershed protection ordinances apply within this

area and COA will be the primary agency for permitting, inspection and enforcement in this area. LCRA's HLWO will not apply within the ETJ.

Stoneledge Recharge Enhancement: COA/LCRA Interlocal Agreement for water rights for Stoneledge Recharge Enhancement Project: COA, LCRA, and BSEACD entered into an agreement in which the LCRA will provide water rights for the COA to divert floodwater from Little Bear Creek into an abandoned quarry. Based on data collected by BSEACD, the water will slowly recharge the aquifer and migrate to Barton Springs, adding base flow to the springs long after the end of rain. The project is a pilot for other larger quarries that could be used to benefit the aquifer after completion of quarry operations. The cumulative effect of these projects could help provide protection for Barton Springs during drought conditions.

Gap Analysis of Data, Study and Coordination Efforts

The City of Austin has identified the following data gaps and is pursuing monitoring and modeling efforts to fill these gaps. Several projects offer unique opportunities for collaboration between the LCRA and the City.

Freshwater Mussel Distribution and Ecology Studies: Populations of freshwater mussels are threatened on a national scale. Preliminary COA studies have identified scattered mussel beds in Blackland Prairie Ecoregion streams feeding the Colorado River on the east side of Austin, although quantitative survey methods are still in development. The physical and chemical factors affecting the distribution and health of mussels, particularly in these first order streams, are largely unknown as are the usability of mussel surveys as a rapid bioassessment indicator of aquatic system integrity. COA is negotiating with Texas State University to develop a quantitative survey method. Fish serve as species-specific hosts for early life stages of mussels, and LCRA's expertise in fish community assessments provides an excellent partnership opportunity.

Microbial Source Tracking: There are multiple water bodies in the Austin area listed as impaired for contact recreation on the State of Texas 303(d) list. As observed during the Total Maximum Daily Load process for the bacteria impairment on Gilleland Creek, identifying the source of the fecal contamination is extremely difficult. Without accurate source identification, solution implementation plans may result in ineffective actions. The City of Austin is evaluating advanced microbial source tracking methods, including library-independent universal quantitative PCR analyses with the University of Texas at Austin in combination with additional chemical indicators like caffeine. The analytical capabilities of the LCRA's Environmental Laboratory Services could be useful in identifying the most reliable and cost-effective methods for fecal contamination sourcing.

Nutrient Dynamic Modeling: The City of Austin is pursuing a better description of nutrient dynamics and primary productivity changes from wastewater discharges in Edwards Plateau springs. Efforts are underway in three watersheds to construct and calibrate WASP water

quality models, including the South Fork of the San Gabriel River downstream of the LCRA Liberty Hill wastewater treatment plant. Once sufficient field data has been collected to support the calibration of these models, they will be useful in extrapolating the impacts of future wastewater discharges in sensitive areas like the Barton Springs contributing zone. These WASP models and other modeling efforts by the City could be integrated into the LCRA's CREMS.

Impacts of Land Application of Wastewater: Recent monitoring data collected by the City of Austin suggests that water quality may be degraded downstream of wastewater land application facilities even when those facilities are operating within their permit limits. Although land application impacts are still substantially less severe than direct, continuous discharges, existing land application rules may need to be updated to provide adequate protection for high quality creeks. The City of Austin is developing monitoring programs utilizing both conventional parameters (e.g., nutrients and fecal bacteria) as well as advanced source water analysis methods (e.g., isotope monitoring) to guide and support potential new rulemaking efforts at TCEQ.

Specific geographic gaps: Wilbarger Creek: The City of Austin has identified a specific spatial gap in monitoring coverage in Wilbarger Creek, east of Austin. Large increases in urbanization are expected in this watershed with the completion of new transportation corridors like SH 130, and the volume of permitted wastewater discharges will increase dramatically in the near future. Only a small portion of the watershed falls within the City of Austin jurisdiction. City of Austin, TCEQ and LCRA field staff are cooperating to add routine monitoring to Wilbarger for the Clean Rivers Program, and the City of Austin is conducting a receiving-water assessment type survey of the watershed in April 2010.

Next Steps

This report is intended to provide the Water Quality Committee and staff from LCRA and COA with guidance on water quality protection within the area of focus. This report is not intended to restrict the water quality staff from working together on other projects not specifically listed, but is intended to provide information and guidance on water quality protection and monitoring in the future.

Appendix 4.

[Letter Agreement - Lady Bird Lake]

City of Austin
Assistant City Manager's Office
P.O. Box 1088, Austin, Texas 78767
(512) 974-2000

February 5, 2010

Suzanne Zarling
Executive Manager, Water Services
Lower Colorado River Authority
P.O. Box 220
Austin, TX 78767-0220

Dear Ms. Zarling:

This letter is to confirm our discussions within the Executive Management Committee (EMC) over the last year regarding Austin's planned contractual accounting for the use of water for the purposes of maintaining Austin's Lady Bird Lake at a relatively constant level. The EMC's Technical Committee, comprised of Austin and LCRA staff, has developed the approach outlined in this letter consistent with these discussions. Specifically, it is Austin's intent that water used to maintain Lady Bird Lake, as discussed in more detail below, be accrued against the water provided by LCRA under the First Amendment to December 10, 1987 Comprehensive Water Settlement Agreement between City of Austin and Lower Colorado River Authority ("1999 Water Contract") as allowed by IV.C(2) and separate contracts as discussed below.

As you recall, this accounting is needed due to the expiration of certain contractual obligations that the Lower Colorado River Authority (LCRA) had to provide water for industrial cooling in Lady Bird Lake, which resulted in Lady Bird Lake being maintained at a relatively constant lake level. The Holly Power Plant ceased power production on September 30, 2007, thus no longer requiring water for industrial cooling, and is in a process of facility decommissioning which is expected to continue over the next few years.

Background

In accordance with Section VII.D. of the 2007 Settlement Agreement between the City of Austin and LCRA, the City of Austin and LCRA Water Partnership was charged with developing a proposal to address maintenance of lake levels after the closing of the City of Austin's Holly Power Plant. Prior to the closing of the power plant, LCRA was obligated to provide water for Lady Bird Lake to maintain adequate water temperatures for industrial cooling purposes under Article IV (E) of the City of Austin and LCRA 1999 agreement and previous agreements executed in 1966 and 1987.

In addition to contractual arrangements to maintain Lady Bird Lake water levels, water to maintain the level of Lady Bird Lake is authorized under Austin's 1959 priority date water right (Certificate of Adjudication 14-5471A), which is Austin's independent State granted water right authorizing the City to impound the waters of the Colorado River behind Longhorn Dam. The City of Austin desires to maintain Lady Bird Lake at a relatively constant level, among other reasons, for the purpose of keeping the lake level viable for a municipal water intake planned for in future decades.

For water use accounting purposes, for the amount each year that cannot be met by Austin's 1959 Lady Bird Lake impoundment water right, Austin will plan to have the remaining amount counted as municipal water use under the 1999 Agreement between the City of Austin and LCRA or separate contracts. *Austin and LCRA will coordinate at the end of each year,* beginning in December 2010, for water used for this purpose, and to determine the amount of water that was available under Austin's own lake impoundment water right and the amount provided by from the LCRA System and counted under the 1999 contract and other contracts.

City of Austin and LCRA staff discussions have focused on addressing the two main water use categories associated with maintaining the water level in Lady Bird Lake. These are: (1) makeup of water to replace natural hydrologic losses (evaporation, seepage, and evapotranspiration) in the lake in order to keep the lake at a relatively constant level, and (2) water loss due to both planned and unscheduled lake lowering events. Austin and LCRA are working on the protocols to handle each of these water use components. Generally, it is the intent that only the additional water supply needed for the purposes that exceeds that amount available from Austin's Lady Bird Lake right will accrue under the 1999 Agreement. However, City of Austin municipal diversions from Lady Bird Lake, once re-initiated, will accrue under the terms of the 1999 Water contract in the same manner as other municipal diversions by the City, regardless of whether the water diverted is diverted pursuant to a water right held by Austin or LCRA.

1) LCRA Makeup of Water to Replace Natural Hydrologic Losses (Evaporation, Seepage, and Evapotranspiration)

The City of Austin is requesting that LCRA use water provided pursuant to the 1999 Agreement to offset the net natural hydrologic losses that occur from the body of the lake during times when water from the underlying water right of Lady Bird Lake is insufficient. Seasonal and yearly changes in temperature, rainfall, and humidity levels will impact the amount of evaporative losses that occur from Lady Bird Lake. During some conditions, an additional source of water is needed to maintain the level of Lady Bird Lake at the relatively constant level of approximately 428 feet above mean sea level, while allowing for the free passage of all water appropriated by downstream water rights.

Initial modeling estimates indicate that the long-term average annual requirement for LCRA backup to the City's water right for Lady Bird Lake to offset evaporative losses while considering current basin-wide water right utilization levels will be approximately 700 acre feet/year. Modeling estimates also indicate that during drought-of-record hydrologic conditions, the average annual requirement for LCRA backup may reach 1,450 acre feet/year under future basin-wide water right utilization levels. Further study may be needed to refine the estimate of water available to the City's 1959 Lady Bird Lake water right for the purposes of contracting and annual water use reporting.

2) Planned Events and Unscheduled Lowerings

City of Austin and LCRA staff are working to develop operational protocols to minimize the release of water from Lady Bird Lake for planned lake lowering events, such as recreational events and maintenance or construction-related activities. Additionally, unscheduled lake lowerings may occur due to unforeseen circumstances, such as unplanned gate operations at Longhorn Dam.

These protocols will formalize the policies and procedures for management of stored water to be released from Lady Bird Lake for lowering events. Austin and LCRA will continue to work together on the specific details of how water from these events will be accounted for as it is anticipated that Austin and LCRA will likely need to review each event and determine how the actual water use amount associated with a given lowering event will be estimated for accounting or separate contracting purposes, as appropriate.

Water Use Reporting:
The City will provide actual water use records for LCRA's use in annual water use reporting to the Texas Commission on Environmental Quality (TCEQ). It is our intention to continue to coordinate the annual water use reporting to TCEQ, including this water use, since, in any given year, this water may come from a combination of the City of Austin's water rights and LCRA's water rights, depending on the source of supply. The City of Austin will report this water as municipal use. Austin and LCRA staff will coordinate on determining the methodology to be used in determining the amount of water used in each case: evaporation and lake lowering events (planned and unscheduled).

Since these accounting and contracting procedures are new for lake maintenance purposes, we anticipate needing to revisit these procedures once Austin and LCRA staff have some time to coordinate on development of detailed procedures and as operations change over time. The City of Austin staff is committed to completing this process of fully developing these procedures for accounting for this water use via water supply contracts and Austin's water right, when applicable.

If this letter accurately reflects your understanding of the approach directed by the EMC, please indicate your agreement by signing below. Should you have any questions or need any clarification, please contact Austin Water Utility Director Greg Meszaros at 972-0108.

Sincerely,

Rudy Garza, Assistant City Manager
City of Austin

AGREED:

Suzanne Zaiting,
Executive Manager, Water Services
Lower Colorado River Authority

cc: Greg Meszaros, Director, Austin Water Utility
Ross Crow, Law Department, City of Austin
Teresa Lutes, Austin Water Utility
Becky Motal, Executive Manager, Lower Colorado River Authority
Lyn Clancy, Legal Services, Lower Colorado River Authority
James Kowis, River Services, Lower Colorado River Authority

The City of Austin is committed to compliance with the Americans with Disabilities Act.
Reasonable modifications and equal access to communications will be provided upon request.

Appendix 5.

[Final, Unexecuted Interlocal Agreement – Stoneledge Quarry]

INTERLOCAL AGREEMENT BETWEEN THE CITY OF AUSTIN, LOWER COLORADO RIVER AUTHORITY AND BARTON SPRINGS/EDWARDS AQUIFER CONSERVATION DISTRICT REGARDING THE STONELEDGE QUARRY RECHARGE ENHANCEMENT PROJECT

The **CITY OF AUSTIN** (the "City"), the **LOWER COLORADO RIVER AUTHORITY** ("LCRA") and the **BARTON SPRINGS/EDWARDS AQUIFER CONSERVATION DISTRICT** (the "District") (hereafter referred to as the "Parties") enter into this Interlocal Agreement ("Agreement") pursuant to Texas Government Code Chapter 791 ("Interlocal Cooperation Act") to work together and commit various resources to develop the Stoneledge Quarry Edwards Aquifer Recharge Enhancement Project.

I.
RECITALS

WHEREAS, the Barton Springs Segment of the Edwards Aquifer (the "Aquifer") is a unique underground system of water bearing formations in Central Texas, wherein water enters the Aquifer through the ground as surface stream inflow and rainfall infiltration, which is rapidly transported in the subsurface by solution conduits and the intrinsic permeability of the rock, and leaves the Aquifer through well withdrawals and spring flows;

WHEREAS, the complex springs known as Barton Springs is located inside the municipal boundaries of the City and is the primary, direct natural outlet for water flowing though the Aquifer and the only known habitat for the endangered Barton Springs Salamander, *Eurycea sosorum*, and the Austin Blind Salamander, *Eurycea waterlooensis*, which is a candidate for endangered species listing under the federal Endangered Species Act;

WHEREAS, Barton Springs is an important recreational, cultural, historical, and water resource for Austin and Central Texas;

WHEREAS, the Aquifer is a federally-designated sole-source of drinking water, which serves as a primary source of drinking water for tens of thousands of people and is a vital resource to the general economy and welfare of the City of Austin and the State of Texas;

WHEREAS, increasing the amount of clean water entering the Aquifer will benefit the Aquifer, the springs, the Colorado River, and aquatic and terrestrial species dependent on this water;

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WHEREAS, the City has purchased an 85 acre tract in northern Hays County that includes an 18 acre quarry ("Stoneledge Quarry");

WHEREAS, the City proposes to construct, operate and maintain an Aquifer recharge project at Stoneledge Quarry that will divert flood flows above 50 cubic feet per second from Little Bear Creek into Stoneledge Quarry, which is expected to seep into the Aquifer over a period of time thereby increasing Aquifer storage and enhancing flows at Barton Springs;

WHEREAS, the City through land purchases and conservation easements now protects over 23,000 acres of land to benefit water quality and quantity that contributes to Barton Springs, including over 40 percent of the watershed upstream of Stoneledge Quarry;

WHEREAS, the City has substantial investment in preserving water quality and quantity in the Barton Springs Zone;

WHEREAS, the Project is a cooperative effort by the City, LCRA, and the District;

WHEREAS, the Hill Country Conservancy has assisted in purchase and plan development of the project;

WHEREAS, the Barton Springs/Edwards Aquifer Conservation District is a Groundwater Conservation District created by an act of the 70th Legislature for the purpose of providing for conservation, preservation, protection, recharging, and prevention of waste of groundwater and of groundwater reservoirs in the Barton Springs segment of the Edwards Aquifer;

WHEREAS, the District has analyzed the estimated downgradient area of the Aquifer that will be provided enhanced flow by the Project and has determined that downgradient areas are predominately built out, are away from major pumping centers, and expect no significant new well permits for this area;

WHEREAS, the Lower Colorado River Authority (LCRA) is a conservation and reclamation district and political subdivision for the state created under Article XVI, Section 59 of the Texas Constitution;

WHEREAS, LCRA holds downstream senior water rights in the lower Colorado River and has obligations to maintain certain instream flows in the lower Colorado River;

WHEREAS, LCRA has pending before the Texas Commission on Environmental Quality ("TCEQ") an application for all remaining unappropriated flows in the lower Colorado River (Application No. 5731);

WHEREAS, flow from Barton Springs enters Lady Bird Lake and typically flows downstream through Longhorn Dam, thereby contributing to the instream flow needs of

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the lower Colorado river at the Austin gage immediately downstream of Longhorn Dam and the needs of downstream senior water rights;

WHEREAS, the LCRA and the District entered into a Memorandum of Understanding, dated March 7, 1988, with the stated purpose of "establish[ing] a cooperative framework within which they both may work toward their common goal of conservation and protection of the Barton Springs segment of the Edwards Aquifer" and whereby LCRA expressed its willingness to cosponsor projects and provide in-kind services and support for projects that conserve and develop the aquifer in a cost-effective and beneficial manner, specifically recognizing that excess flood flows may be an appropriate source of water for such projects;

WHEREAS, the LCRA and the City entered into a Settlement Agreement dated June 18, 2007, whereby LCRA and the City created a formal water resource management partnership for the purposes of "evaluat[ing] and implementing strategies that will optimize water supplies to meet water needs of the [City's and LCRA's] customers and the environment";

WHEREAS, the Stoneledge Quarry Edwards Aquifer Recharge Enhancement Project meets the stated purpose of the 1988 MOU between LCRA and the District and which is consistent with the purposes of the 2007 Settlement Agreement between LCRA and Austin;

NOW THEREFORE, in consideration of these premises, the mutual covenants of each party, and other good and valuable consideration, the receipt and sufficiency of which are acknowledged, the Parties agree as follows:

II.
DEFINITIONS

2.01. Project. Stoneledge Quarry Edwards Aquifer Recharge Enhancement Project, consists of the construction, operation and maintenance of the Facilities described in Section 2.02, and is located adjacent to Little Bear Creek in Hays County, (approximately 2.6 miles NW of the intersection of FM 1626 and FM 967) on 85 acres of property purchased by the City. This 85 acre tract contains the 18 acre quarry adjacent to Little Bear Creek and all the area on which the Facilities will be constructed, operated and maintained. [Attached as Exhibit A.]

2.02. Facilities. Flood diversion structures necessary to divert, monitor, and recharge flood waters from Little Bear Creek into Stoneledge Quarry.

2.03. Drought Trigger Levels. As defined in the District's Rules, the level of water in the Aquifer and flow amounts at Barton Springs that determine whether the District puts into effect certain Aquifer pumping restrictions.

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III.
CITY OF AUSTIN RESPONSIBILITIES

3.01. The City will fund construction, operation, and maintenance of all of the Facilities associated with the Project. The Facilities will be designed to divert into Stoneledge Quarry flows in Little Bear Creek above 50 cubic feet per second, which occurs during flood events.

3.02. The City will apply for and pay all necessary application costs and notice fees associated with obtaining State water rights permits from the Texas Commission on Environmental Quality and any other necessary permits from local, state or federal agencies.

3.03. The City will monitor and keep records of inflows into Stoneledge Quarry for the first 10 years of operation and will report to the other Parties on an annual basis.

3.05. The City will fund separate research related to Aquifer water as it deems appropriate.

3.06. The City will work with the other Parties on the development and implementation of a monitoring plan for the Project.

IV.
LOWER COLORADO RIVER AUTHORITY RESPONSIBILITIES

4.01. LCRA will reserve 40.2 acre-feet of firm water per year for use by the Project, as presented in surface water modeling technical memorandum attached as **Exhibit B**. The reservation shall be effective upon execution of this Agreement and shall continue for a period of fifty (50) years from the date the issuance of the applicable State water rights permit for this project.

4.02. LCRA will provide in-kind staff services, as determined by LCRA as necessary, to support acquisition of applicable State water rights permits for this project and will participate in review and evaluation of project implementation and monitoring.

4.03. LCRA will support issuance of the applicable State water rights permit for the Project.

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V.
BARTON SPRINGS/EDWARDS AQUIFER CONSERVATION DISTRICT RESPONSIBILITES

5.01. The District will examine the feasibility of adjusting Drought Trigger Levels to account for additional water in the Aquifer due to recharge from the Stoneledge Quarry.

5.02. Any future withdrawals by current or new exempt users notwithstanding, the District will not consider water entering the Aquifer resulting from the Project as new water supply to be permitted by the District as available during severe drought and, to the extent such new supplies are quantified by scientific consensus as sustainable additional net recharge during severe drought, the District will designate them as Ecological Flows, as allowed under current rules.

5.03. The District will provide in-kind staff services, as determined by the District as necessary, to support acquisition of water rights and applicable State permits.

5.04. The District will contribute data collected under previous studies, including tracing, water quality sampling, monitoring wells, and water level measurements.

VI.
WATER RIGHTS

6.01. The Parties agree that water entering the Colorado River via Barton Springs and Barton Creek is state water subject to the prior appropriation system and a call by senior downstream water rights in the Colorado River Basin.

6.02. The Parties agree that water discharging from the Aquifer into Barton Springs is subject to use authorized under the City's water rights and LCRA's downstream senior water rights and LCRA's Water Management Plan.

6.03 The Parties recognize that the owner of the property overlying the groundwater within the boundaries of the District may have a legal claim to the groundwater, subject to restrictions and regulations imposed by the District.

VII.
INTERGOVERNMENTAL COMMUNICATIONS

DRAFT

7.01 To provide for consistent and effective communication between BSEACD, Austin, and the LCRA, each Party shall appoint a Principal Representative to serve as its central point of contact on matters relating to this Agreement. The BSEACD has designated W. F. "Kirk" Holland as its Principal Representative, Austin has designated David A. Johns as its Principal Representative, and LCRA has designated Suzanne Zarling, Executive Manager, Water Services as its Principal Representative.

VIII.
GENERAL PROVISIONS

8.01. Interpretation. Except where the context otherwise clearly requires, in this Agreement:

(a) words imparting the singular will include the plural and vice versa;

(b) all exhibits attached to this Agreement are incorporated by reference for all purposes as if fully copied and set forth at length; and

(c) references to any document mean that document as amended or as supplemented from time to time, and references to any party mean that party, its successors, and assigns.

8.02. Entire Agreement. This Agreement, including any attached exhibits, constitutes the entire agreement between the parties regarding recharge of Stoneledge Quarry and supersedes all prior or contemporaneous understandings or representations, whether oral or written, respecting recharge of Stoneledge Quarry.

8.03. Amendment. No amendment of this Agreement will be effective until the amendment has been reduced to writing, each party has duly approved it, and is signed by the authorized representatives of the parties. Any amendment will incorporate this Agreement in every particular not otherwise changed by the amendment.

8.04 Termination of 1988 MOU Between LCRA and District. The Memorandum of Understanding between Lower Colorado River Authority and Barton Springs-Edwards Aquifer Conservation District, dated March 7, 1988, is hereby terminated.

8.05. No Amendment of Other Agreements. Unless otherwise expressly stipulated, this Agreement is separate from and will not constitute an amendment or modification of any other agreement between the parties.

8.06. Other Instruments, Actions. The parties agree that they will take such further actions and execute and deliver any other consents, authorizations, instruments, or documents that are necessary or incidental to achieve the purposes of this Agreement.

DRAFT

8.07. No Third Party Beneficiaries. Except as expressly provided in this Agreement, nothing will be construed to confer upon any person other than the parties any rights, benefits or remedies under or because of this Agreement.

8.08. No Joint Venture, Partnership, Agency. This Agreement will not be construed in any form or manner to establish a partnership, joint venture or agency, express or implied, nor any employer-employee or borrowed servant relationship by and among the parties.

8.09. Applicable Law. This Agreement will be construed under and according to the laws of the State of Texas.

8.10. Severability. The provisions of this Agreement are severable. If any court of competent jurisdiction will ever holds any word, phrase, clause, sentence, paragraph, section, or other part of this Agreement or the application of it to any person or circumstance to be invalid or unconstitutional for any reason, it will not affect the remainder of this Agreement and, in such event, this Agreement will be construed as if it had never contained such invalid or unconstitutional portion in it.

8.11. Venue. Venue for any suit arising under this Agreement will be in Travis County, Texas.

8.12. Duplicate Originals. The parties may execute this Agreement in one or more duplicate originals each of equal dignity.

8.13. Expiration of Agreement. This Agreement terminates upon the earlier of the expiration of the LCRA's reservation of water for this project or upon the termination or denial of the required State water rights permit, unless otherwise extended by separate written agreement.

8.14. Effective Date. This Agreement will be effective upon due execution by all parties.

DRAFT

APPROVED AS TO FORM:

CITY OF AUSTIN:

By: _____

Assistant City Attorney

Sue Edwards
Assistant City Manager

Date: _____

APPROVED AS TO FORM:

_____
Attorney

LOWER COLORADO RIVER AUTHORITY:

By: _____
Suzanne Zarling
Executive Manager, Water Services

Date: _____

APPROVED AS TO FORM:

_____
Bill Dugat
General Counsel

BARTON SPRINGS/EDWARDS AQUIFER CONSERVATION DISTRICT:

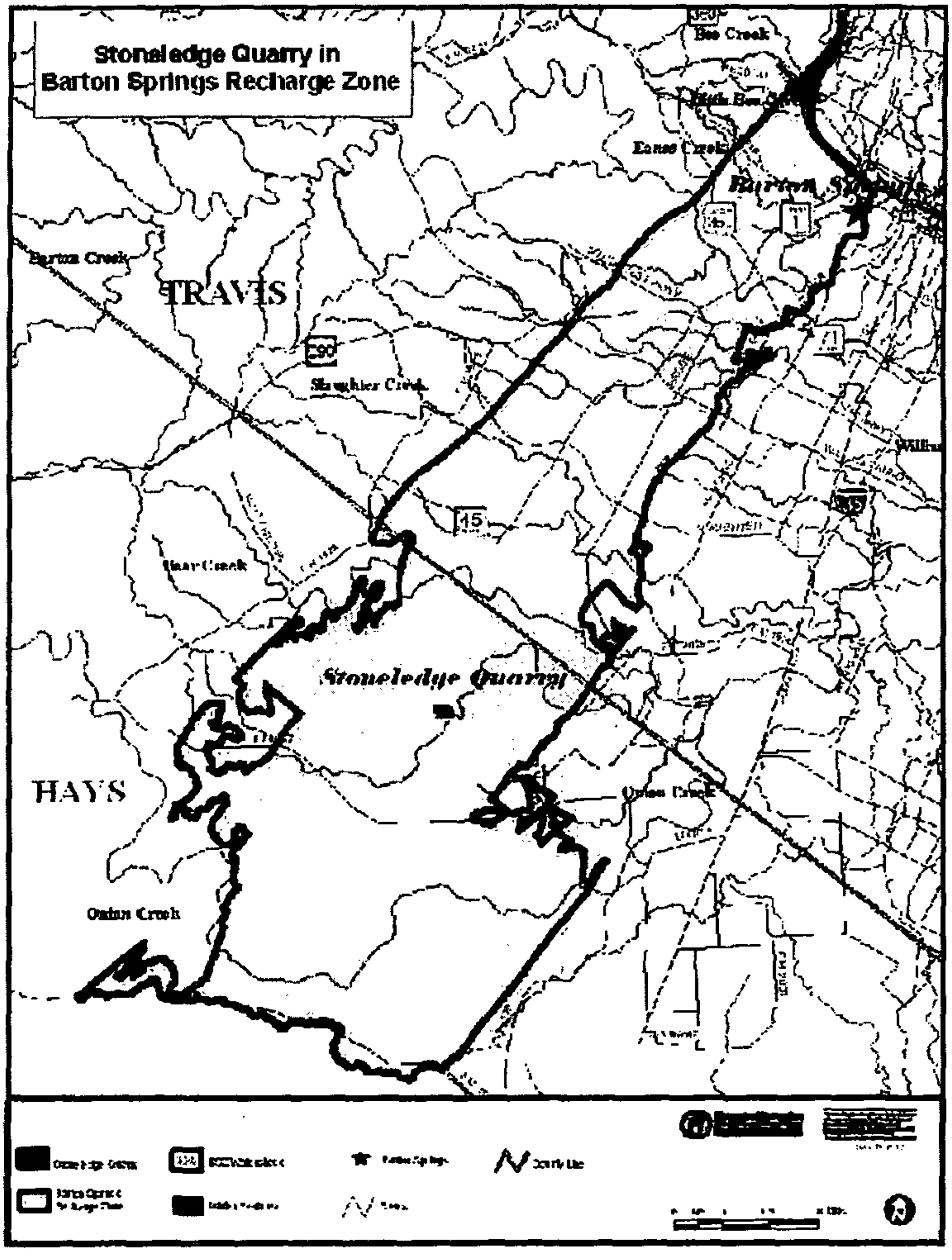
By: _____
Mary Stone
President, Board of Directors

Date: _____

ATTEST: By: _____
C. Craig Smith
Secretary, Board of Directors

Date: _____

DRAFT


Stoneledge Quarry in
Barton Springs Recharge Zone
TRAVIS
HAYS
Stoneledge Quarry
Barton Creek
Slaughter Creek
Onion Creek
Bee Creek

MEMORANDUM

TO: Austin-Lower Colorado River Authority Water Partnership Technical Committee

FROM: Richard Hoffpauir
Consultant

Kris Martinez, P.E.
Lower Colorado River Authority

DATE: April 21, 2009

RE: Evaluating the Impacts of Proposed Diversions from Little Bear Creek into Stoneledge Quarry

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1. Summary

The City of Austin proposes to use the Stoneledge Quarry to enhance the discharge at Barton Springs. The project will also serve as a pilot study to evaluate the benefits of developing recharge enhancement projects. A portion of the storm flows from Little Bear Creek would be diverted into a conveyance channel that connects with the quarry. Once impounded, the water would slowly recharge the Barton Springs Edwards Aquifer (BSEA) through the quarry's karst features. The storage capacity of the quarry is 385 acre-feet (ac-ft).

The TCEQ Water Availability Model (WAM) Run 3 Version 05/31/05 was used to evaluate the impact of the proposed diversion from Little Bear Creek on LCRA's downstream water rights associated with the Garwood, Lakeside, Pierce Ranch and Gulf Coast irrigation operations. The model was also used to estimate the amount of additional releases that would be needed to support downstream environmental flows conditions related to LCRA's Water Management Plan (WMP). Using a priority date senior to LCRA's Garwood water right, WAM results indicate that the proposed diversion on Little Bear Creek could cause a reduction in run-of-river (ROR) availability for the downstream water rights associated with the Gulf Coast and Lakeside irrigation operations. These two water rights are junior to the Garwood water right. The maximum reduction in ROR availability on a ten-year average basis is estimated to be approximately 15 acre-feet per year (ac-ft/yr). This reduction in availability would have to be made up with stored water releases from lakes Buchanan and Travis. WAM results also indicate that additional releases would be needed to support downstream environmental flows related to LCRA's WMP. The maximum amount of additional releases on a ten-year average basis is estimated to be 24 ac-ft/yr. The total combined impact from the reduction in ROR availability and additional releases is estimated to be 39 ac-ft/yr. An amount greater than 39 ac-ft/yr would need to be released to overcome delivery losses between the lakes, environmental flow gage points and the irrigation divisions. Delivery losses are estimated

to be 3.1%. An additional release of 1.2 ac-ft/yr would be needed to make up for delivery losses. Therefore, about 40.2 ac-ft/yr would need to be released from lakes Buchanan and Travis to make up for the total estimated impacts.

2. Background

The inactive Stoneledge Quarry is located off-channel and near Little Bear Creek within the Onion Creek watershed of the Colorado River. Approximately 0.34 square miles (215 acres) of drainage area have been impounded by the quarry since excavation began in the 1970's. The water table of the BSEA at times intersects and is exposed at the lowest points within the quarry. Supplementing storage within the quarry with flows from Little Bear Creek would supplement the recharge over time to the BSEA.

A bypass weir will be used to restrict diversions from Little Bear Creek to events of 50 cfs or greater. Approximately half of the flows on Little Bear Creek in excess of 50 cfs can be diverted by gravity into the connecting conveyance channel as long as storage capacity is available. The location of the proposed diversion is below almost all of the known natural stream recharge features on Little Bear Creek based on stream flow measurements. There is approximately 10.9 square miles (6,984 acres) of upstream contributing drainage area, as shown in Figure 1. The location of the Stoneledge Quarry in relation to the City of Austin is shown in Figure 2.

3. WAM Simulation Results

The WAM results indicate the average annual diversion of flows from Little Bear Creek into Stoneledge Quarry could be 155.5 ac-ft/yr. During a repeat of the drought hydrology from 1947 through 1956, the WAM estimates an average diversion of 1.5 ac-ft/yr would be available. As shown in Figures 3 and 4, the annual simulated diversion from Little Bear Creek is zero for approximately 40% of the period of record.

Figure 1. Location of the Stoneledge Recharge Enhancement Project

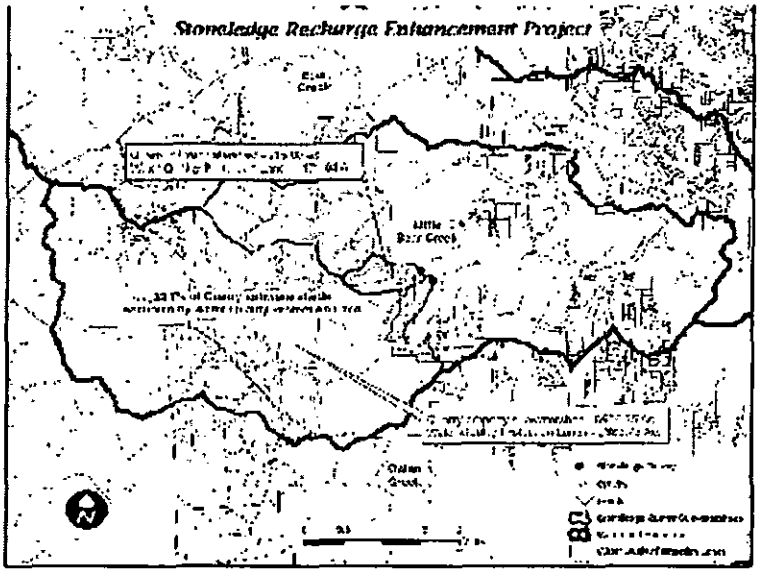


Figure 2. Location of Stoneledge Quarry in relation to Austin

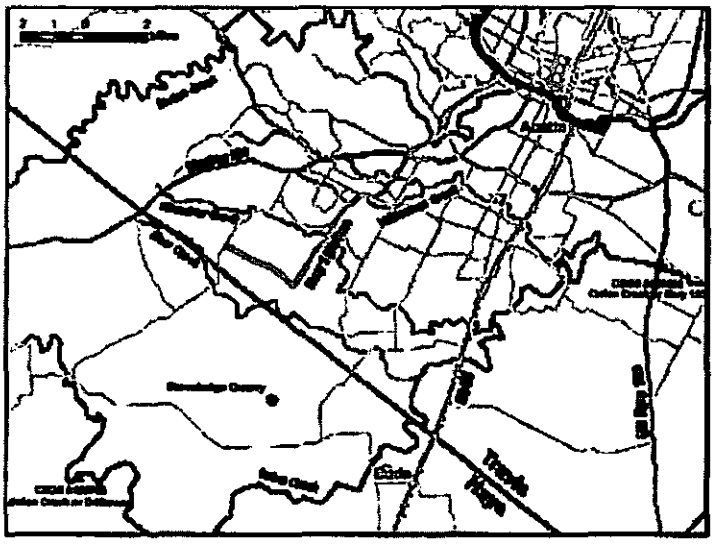


Figure 3. Diversions from Little Bear Creek

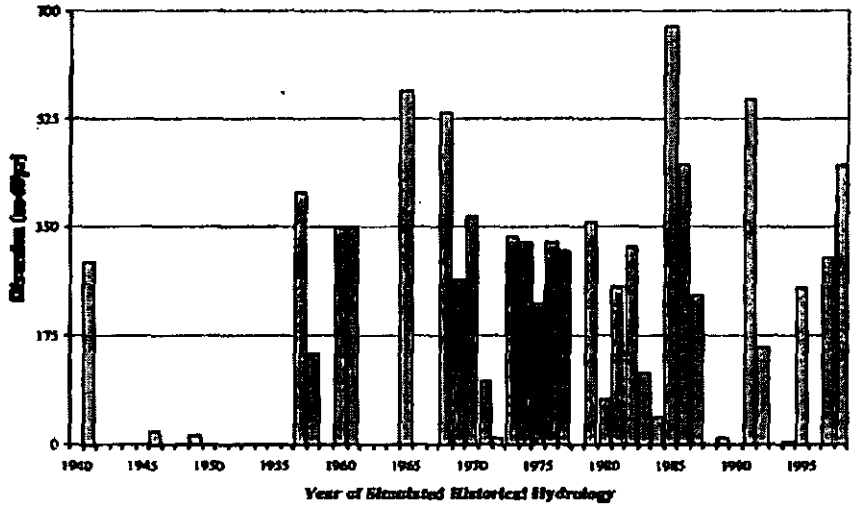
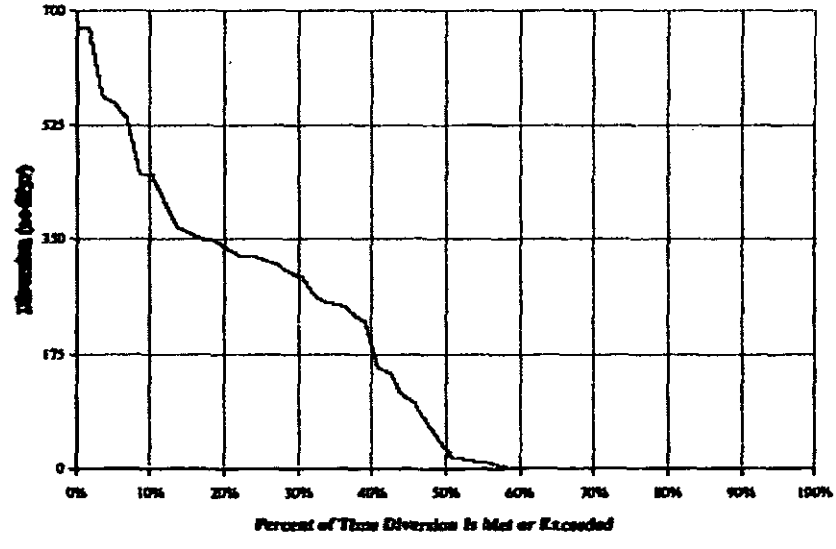
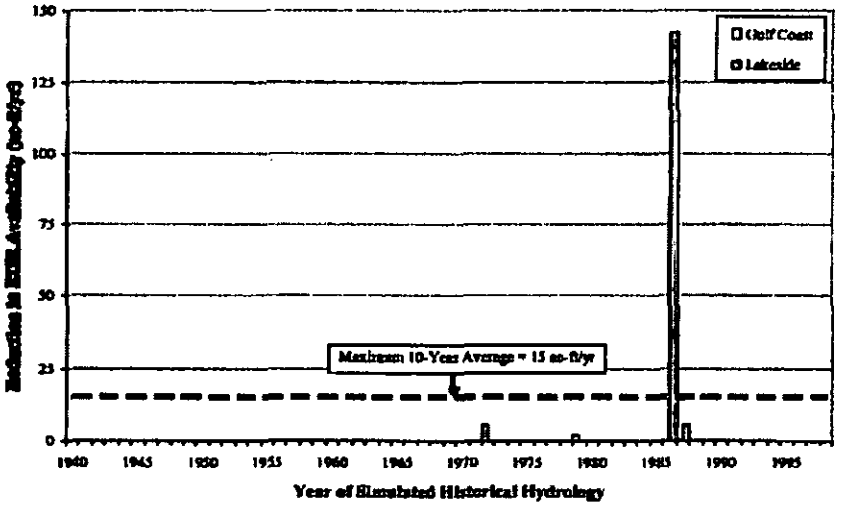


Figure 4. Reliability of Diversion from Little Bear Creek



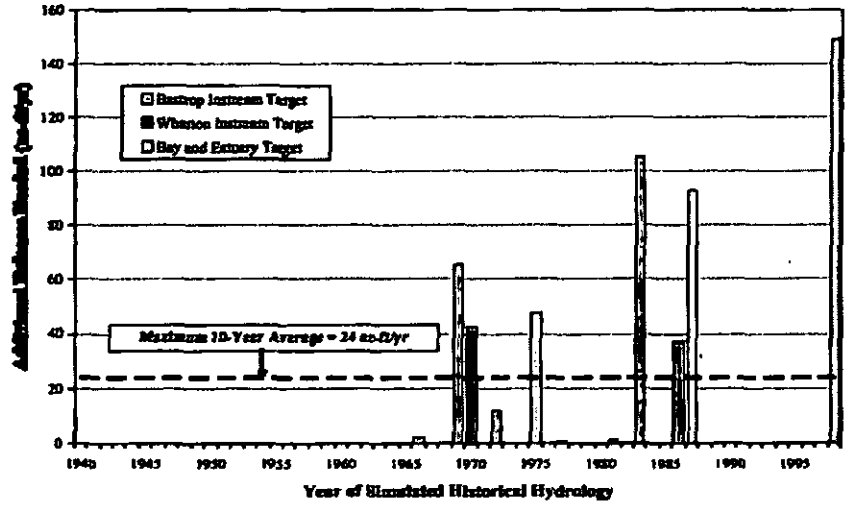
Proposed diversions from Little Bear Creek into the Stoneledge Quarry were modeled with a priority date senior to LCRA's irrigation rights, simulating an operation that would allow diversions to occur without reduction from downstream priority calls on inflow. The maximum reduction in ROR availability on a ten-year average basis for LCRA's downstream irrigation water rights is estimated to be 15 ac-ft/yr. Figure 5 illustrates the WAM's estimated reduction of water availability to LCRA's irrigation rights downstream of the Onion Creek watershed as a result of the seniority assumption for Stoneledge Quarry.

Figure 5. Reduction in Run-of-River Availability for Downstream LCRA Irrigation Rights by Senior Diversions on Little Bear Creek



Senior diversions into Stoneledge Quarry from Little Bear Creek would also reduce the flow on Onion Creek that contribute to flow in the Colorado River. To make up for the reduction, LCRA would need to release more water to support instream flows on the Colorado River and freshwater inflows to Matagorda Bay. The maximum amount of additional releases on a ten-year average basis is estimated to be 24 ac-ft/yr. Figure 6 shows the estimated amount of additional releases needed to support environmental flows under LCRA's WMP.

Figure 6. Additional Releases Needed to Supplement Downstream Environmental Flows due to Senior Diversions on Little Bear Creek



The total combined impact from the reduction of ROR availability and additional releases needed for environmental flows is estimated to be 39 ac-ft/yr. An amount greater than 39 ac-ft/yr (i.e. approximately 40.2 ac-ft/yr) would need to be released due to downstream delivery losses. The losses incurred in delivering water to the confluence of the Colorado River and Onion Creek were estimated using a methodology described in the "Downstream Contract Conveyance Losses" memorandum (Landreth, 11/15/07). Using this methodology, delivery losses were estimated to be 3.1%. Thus, an additional release of 1.2 ac-ft/yr would be needed to make up for delivery losses.

4. Further Study

The draft version of Permit 5731 (LCRA's unappropriated flows permit) was included in the simulation though the impacts are not reported in this memo. When the special conditions are finalized and the permit is granted, it may be necessary to revisit the WAM impact analysis. Permit 5731 will carry a senior priority date to any surface water diversion permit sought for the Stoneledge Quarry project.

Increases to spring flow discharge as a result of enhanced recharge to the BSEA were not added to the WAM. If Barton Springs experiences a quantifiable increase in spring flow, this information could be encoded into the WAM as a flow adjustment or return flow event. The increase in available State water at Barton Springs may offset some modeled impacts to LCRA's downstream water rights and environmental flow maintenance. Similarly, the rate of recharge from Stoneledge Quarry used in the WAM is an approximation based on limited data. Additional monitoring will help to improve the

WAM representation of the rate of recharge, and therefore help to improve the simulated time series of available storage capacity to be filled by diversions from Little Bear Creek and the quarry's natural drainage area.

The City of Austin Watershed Protection and Development Review Department has and continues to collect stream flow and precipitation data at the proposed diversion channel location on Little Bear Creek. The data covers November 3, 2003 through the present in 1-minute increments. These data were used to calibrate an equation for naturalized flow transfer within the WAM. As more data become available, the equation of gaged to ungaged transfer of naturalized flow within the WAM may be improved.